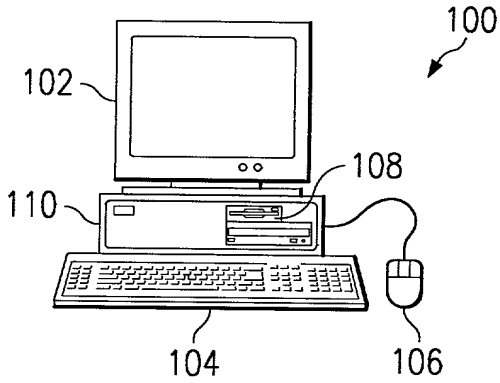
#3

FIG. 1



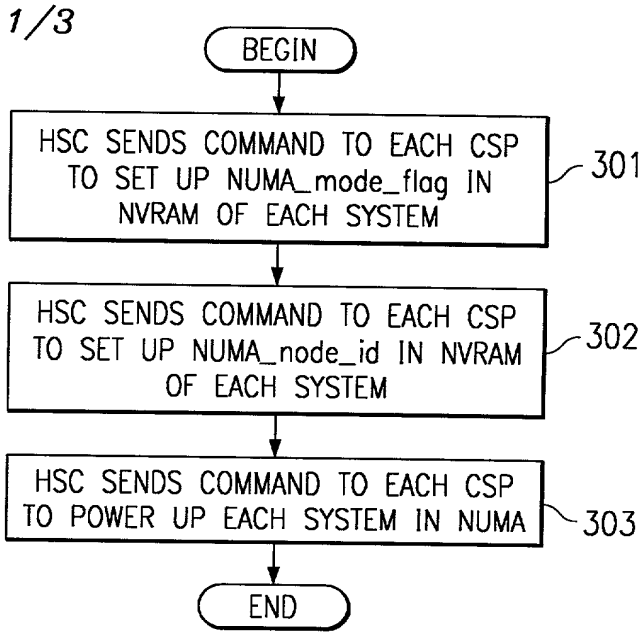


FIG. 3

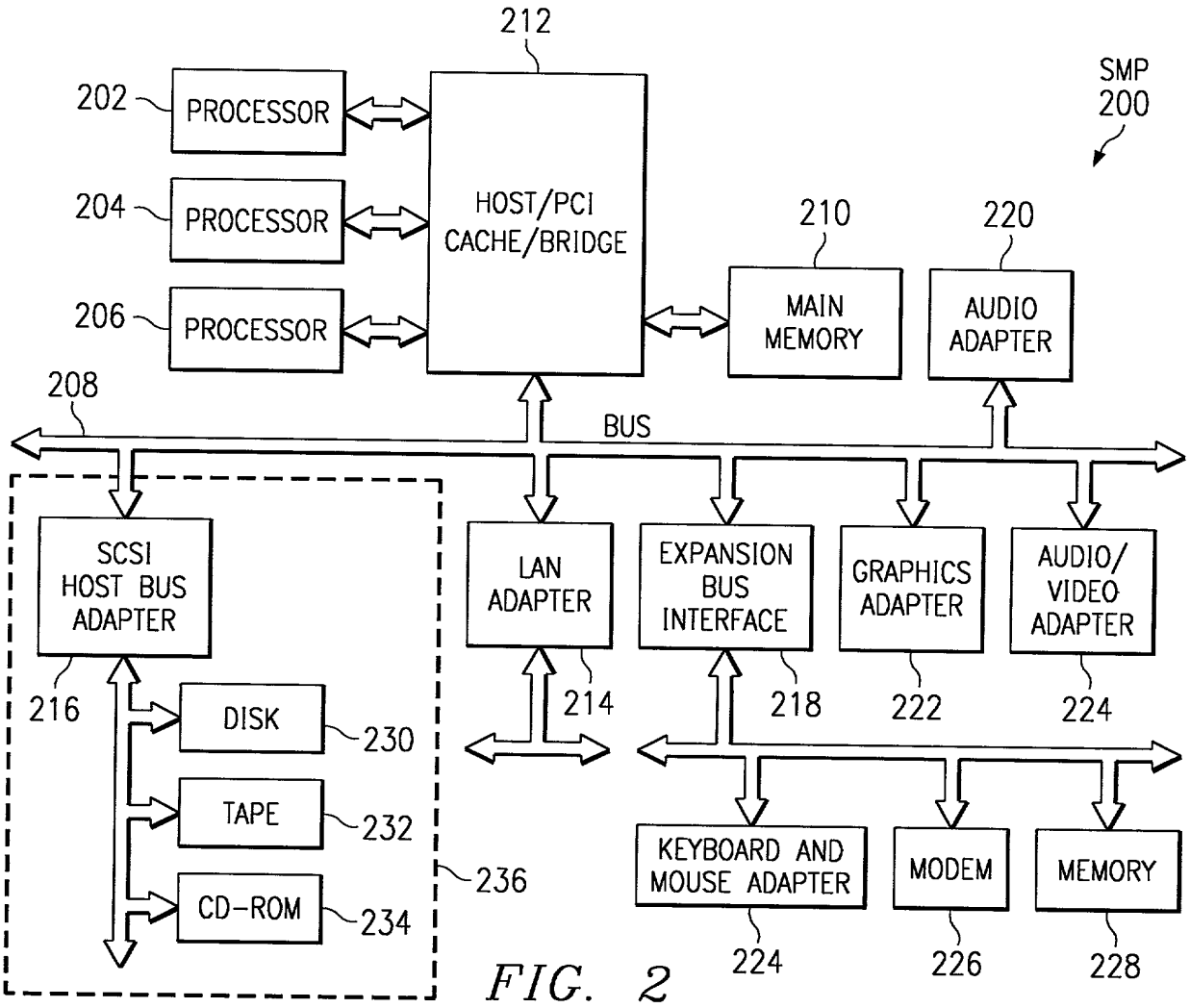


FIG. 2

Express Mail Label No. EV339369809

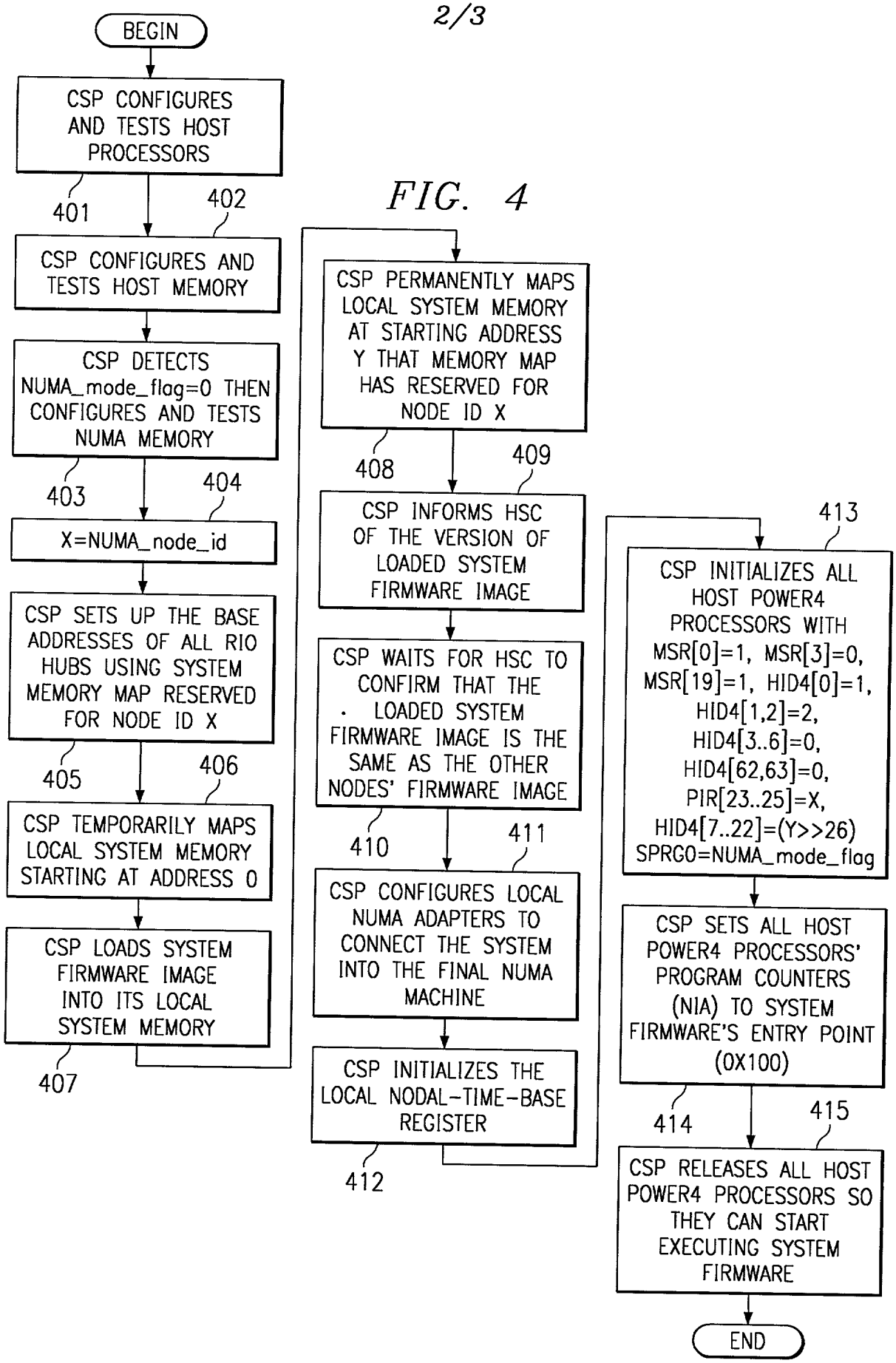

BEGIN
CSP CONFIGURES AND TESTS HOST PROCESSORS
401
CSP CONFIGURES AND TESTS HOST MEMORY
402
CSP DETECTS NUMA_mode_flag=0 THEN CONFIGURES AND TESTS NUMA MEMORY
403
X=NUMA_node_id
404
CSP SETS UP THE BASE ADDRESSES OF ALL RIO HUBS USING SYSTEM MEMORY MAP RESERVED FOR NODE ID X
405
CSP TEMPORARILY MAPS LOCAL SYSTEM MEMORY STARTING AT ADDRESS 0
406
CSP LOADS SYSTEM FIRMWARE IMAGE INTO ITS LOCAL SYSTEM MEMORY
407
CSP PERMANENTLY MAPS LOCAL SYSTEM MEMORY AT STARTING ADDRESS Y THAT MEMORY MAP HAS RESERVED FOR NODE ID X
408
CSP INFORMS HSC OF THE VERSION OF LOADED SYSTEM FIRMWARE IMAGE
409
CSP WAITS FOR HSC TO CONFIRM THAT THE LOADED SYSTEM FIRMWARE IMAGE IS THE SAME AS THE OTHER NODES' FIRMWARE IMAGE
410
CSP CONFIGURES LOCAL NUMA ADAPTERS TO CONNECT THE SYSTEM INTO THE FINAL NUMA MACHINE
411
CSP INITIALIZES THE LOCAL NODAL-TIME-BASE REGISTER
412
CSP INITIALIZES ALL HOST POWER4 PROCESSORS WITH MSR[0]=1, MSR[3]=0, MSR[19]=1, HID4[0]=1, HID4[1,2]=2, HID4[3..6]=0, HID4[62,63]=0, PIR[23..25]=X, HID4[7..22]=(Y>>26) SPRG0=NUMA_mode_flag
413
CSP SETS ALL HOST POWER4 PROCESSORS' PROGRAM COUNTERS (NIA) TO SYSTEM FIRMWARE'S ENTRY POINT (0X100)
414
CSP RELEASES ALL HOST POWER4 PROCESSORS SO THEY CAN START EXECUTING SYSTEM FIRMWARE
415
END

FIG. 4

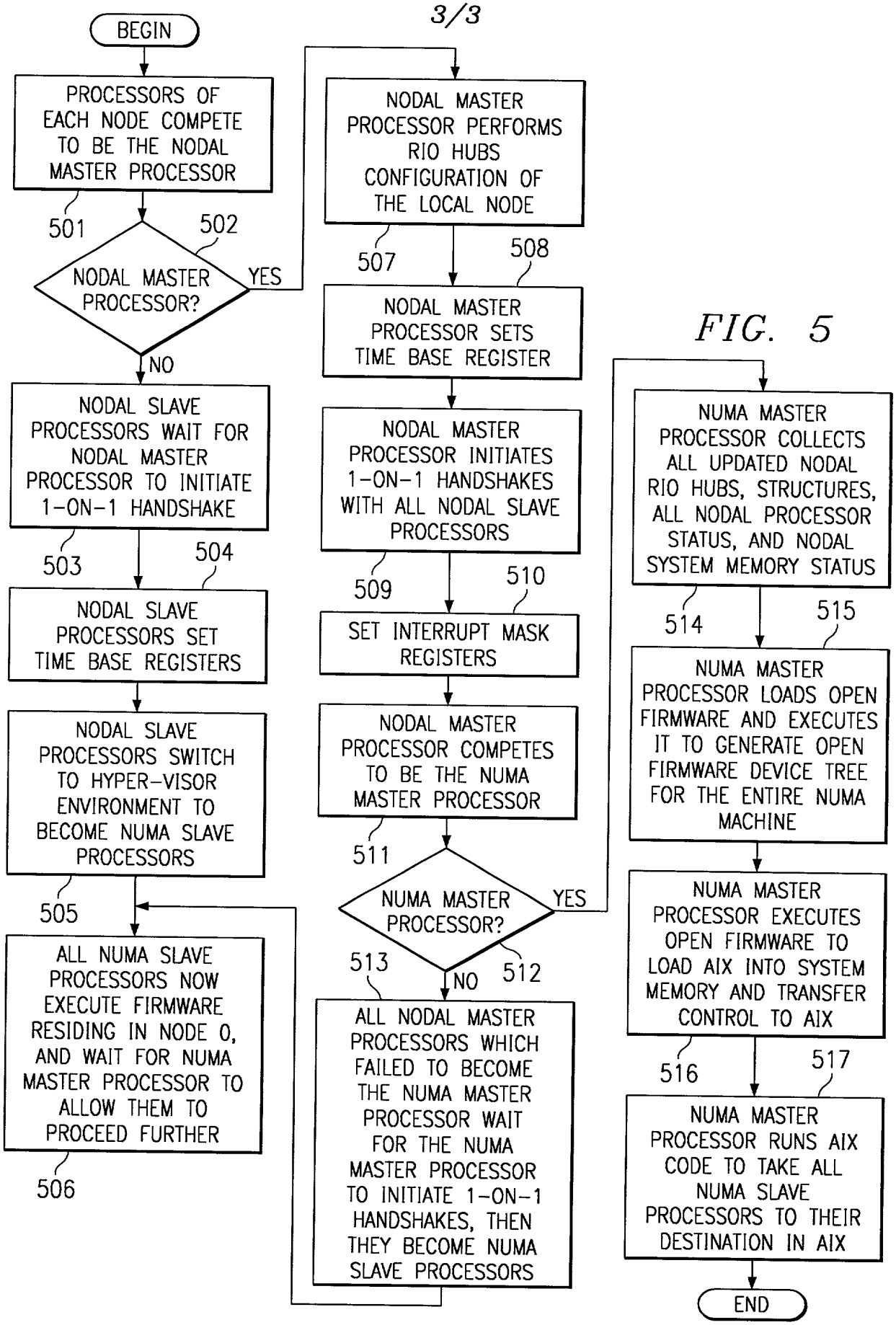

BEGIN
PROCESSORS OF EACH NODE COMPETE TO BE THE NODAL MASTER PROCESSOR
501
502
NODAL MASTER PROCESSOR?
YES
NO
NODAL SLAVE PROCESSORS WAIT FOR NODAL MASTER PROCESSOR TO INITIATE 1-ON-1 HANDSHAKE
503
504
NODAL SLAVE PROCESSORS SET TIME BASE REGISTERS
NODAL SLAVE PROCESSORS SWITCH TO HYPER-VISOR ENVIRONMENT TO BECOME NUMA SLAVE PROCESSORS
505
ALL NUMA SLAVE PROCESSORS NOW EXECUTE FIRMWARE RESIDING IN NODE 0, AND WAIT FOR NUMA MASTER PROCESSOR TO ALLOW THEM TO PROCEED FURTHER
506
NODAL MASTER PROCESSOR PERFORMS RIO HUBS CONFIGURATION OF THE LOCAL NODE
507
508
NODAL MASTER PROCESSOR SETS TIME BASE REGISTER
NODAL MASTER PROCESSOR INITIATES 1-ON-1 HANDSHAKES WITH ALL NODAL SLAVE PROCESSORS
509
510
SET INTERRUPT MASK REGISTERS
NODAL MASTER PROCESSOR COMPETES TO BE THE NUMA MASTER PROCESSOR
511
NUMA MASTER PROCESSOR?
YES
NO
512
513
ALL NODAL MASTER PROCESSORS WHICH FAILED TO BECOME THE NUMA MASTER PROCESSOR WAIT FOR THE NUMA MASTER PROCESSOR TO INITIATE 1-ON-1 HANDSHAKES, THEN THEY BECOME NUMA SLAVE PROCESSORS
NUMA MASTER PROCESSOR COLLECTS ALL UPDATED NODAL RIO HUBS, STRUCTURES, ALL NODAL PROCESSOR STATUS, AND NODAL SYSTEM MEMORY STATUS
514
515
NUMA MASTER PROCESSOR LOADS OPEN FIRMWARE AND EXECUTES IT TO GENERATE OPEN FIRMWARE DEVICE TREE FOR THE ENTIRE NUMA MACHINE
NUMA MASTER PROCESSOR EXECUTES OPEN FIRMWARE TO LOAD AIX INTO SYSTEM MEMORY AND TRANSFER CONTROL TO AIX
516
517
NUMA MASTER PROCESSOR RUNS AIX CODE TO TAKE ALL NUMA SLAVE PROCESSORS TO THEIR DESTINATION IN AIX
END

FIG. 5